CLAIMS

1.   A method for screening an array of materials for one or more adhesive properties, comprising:

    providing a library of at least four sample materials;

    contacting the at least four sample materials with at least one member for applying one or more forces to the at least four sample materials in opposition to the one or more adhesive properties of the at least four sample materials wherein the at least one member is moved by an automatic system for applying the one or more forces;

    monitoring a response of each of the at least four sample materials to the one or more forces; and

    correlating the response of the each of the at least four sample materials to the one or more adhesive properties of the each of the at least four sample materials.

2.   A method as in claim 1, wherein the step of providing a library of at least four sample materials includes attaching each of the at least four sample materials to a single substrate.

3.   A method as in claim 2, further comprising raising the temperature of the at least four sample materials prior to applying the one or more forces to the at least four sample materials.

4.   A method as in claim 2, further comprising lowering the temperature of the at least four sample materials prior to applying the one or more forces to the at least four sample materials.

5.   A method as in claim 2, wherein a first of said one or more forces is applied to a first of the at least four sample materials no more than five minutes previous to applying a second of said one or more forces to a second of the at least four sample materials.

6. A method as in claim 1, wherein said library includes at least 16 different sample materials.

7. A method as in claim 1, wherein at least one of the at least four sample materials is a polymer.

8. A method as in claim 1, wherein the at least four sample materials are gels.

9. A method as in claim 1, wherein the one or more forces places a tensile stress upon the at least four sample materials.

10. A method as in claim 1, wherein the one or more forces are applied with a probe having a flexible contacting portion.

11. A method as in claim 1, wherein said library includes at least 16 different materials, each attached to a single substrate and wherein the throughput rate of testing the at least 16 different materials is no greater than 10 minutes per material.

12. A method as in claim 1, wherein the automatic system includes a robot arm.

13. A method for measuring an adhesive property of a plurality of sample materials, the method comprising the steps of:
    providing a library comprising at least four different sample materials; and
    serially measuring the adhesive property of each of the at least four different sample materials at a throughput rate no greater than about 5 minutes per sample material.

14. A method as in claim 13, wherein the library includes at least 8 different sample materials.

15. A method as in claim 13, wherein the library includes at least 16 different sample materials.

16. The method of claim 13, wherein the adhesive property of the at least four sample materials is measured at an average sample-throughput of not more than about 2 minutes per sample material.

17. The method of claim 13 wherein the library comprises at least 8 sample materials and at least about 50% of the at least 8 sample materials are different from each other.

18. The method of claim 13, wherein the library comprises at least 16 sample materials and at least 75% of the at least 16 sample materials are different from each other.

19. The method of claim 13, wherein the at least four sample materials are members of a combinatorial library of polymerization product mixtures.

20. A method for screening an array of materials for one or more adhesive properties, comprising:

providing a library of at least 16 sample materials wherein each of the at least 16 sample materials is physically attached to a single substrate;

contacting the at least 16 sample materials with at least one member such that the at least 16 sample materials adhesively secure themselves to the at least one member wherein the at least one member includes a flexible portion for assisting in controlling the amount of force with which the at least one member contacts the at least 16 sample materials and wherein a first sample material is contacted by the at least one member no more than 8 minutes prior to contacting a second sample material of the at least 16 sample materials;

moving the at least one member away from the at least 16 sample materials with a robot arm for applying one or more forces to the at least 16 sample materials in opposition to the one or more adhesive properties of the at least 16 sample materials wherein the at least one member is moved;

monitoring the amounts of force required to separate the at least one member from the at least 16 sample materials using one or more load cells;

correlating the amounts of force required to separate the at least one member from the at least 16 sample materials to the one or more adhesive properties of the each of the at least four sample materials; and

ranking the adhesive properties of the each of the at least 16 sample materials relative to each other.